

June 11, 1996

## PROTOCOL

INCLUDING TERMS, CONDITIONS AND ASSUMPTIONS,  
SUMMARY BALANCE OF CONTRIBUTIONS AND OBLIGATIONS TO  
INTERNATIONAL SPACE STATION (ISS)  
AND RESULTING RIGHTS OF NASA AND RSA TO ISS UTILIZATION  
ACCOMMODATIONS AND RESOURCES, AND FLIGHT OPPORTUNITIES

1. The National Aeronautics and Space Administration (NASA) and the Russian Space Agency (RSA), ("the Parties") will begin to implement the understandings outlined in this Protocol ("the Protocol") regarding the balance of the Parties' contributions and obligations immediately upon the written approval by the respective agencies. The terms, conditions and assumptions specified in this Protocol will be summarized and incorporated in and subject to the conclusion of the NASA/RSA Memorandum of Understanding ("NASA/RSA MOU"). Upon entry into force of the NASA/RSA MOU, the MOU will take precedence over this Protocol and this Protocol will constitute an implementing arrangement under the Space Station Intergovernmental Agreement (IGA) and the NASA/RSA MOU. The Parties recognize that the understandings documented in this Protocol exist within the framework of a single integrated Space Station. The Parties assume and intend that the terms of this Protocol are consistent with NASA's bilateral MOUs with the other ISS partners. These understandings will be implemented through the management mechanisms defined in the NASA/RSA MOU under the lead integration role of NASA. For the purposes of this Protocol, the ISS vehicle consists of two segments: the Russian Segment and the American Segment. The Russian Segment contains the Russian elements and the NASA-provided FGB, while the American Segment includes the remaining NASA-provided elements and the elements provided by all ISS international partners other than RSA.
2. This Protocol, except as otherwise specifically indicated, will not nullify or void any previous agreements reached by the technical teams or those agreements already contained in program documentation. In the case of conflict between such previous agreements and this Protocol, this Protocol will take precedence.

3. This Protocol, together with the IGA, the NASA/RSA MOU, and existing and any future contractual and cooperative arrangements, represents the complete arrangement between NASA and RSA regarding the balance of the Parties' respective contributions and obligations to the Program, and the sharing of responsibilities associated with each Party's participation in the Program. If it is necessary in the future to adjust the Parties' contributions and obligations, and those adjustments have cost implications, any issues arising from the adjustments will be resolved, if the Parties agree, through barter and will not require renegotiation of the terms of this Protocol or additional discussion to quantify the cost impact. NASA's and RSA's responsibilities for performance of common system operations (as defined in Article 9.3 of the existing Memoranda of Understanding between NASA and the European Space Agency (ESA), NASA and the Government of Japan (GOJ) and NASA and the Canadian Space Agency (CSA), and the draft NASA/RSA MOU), have been taken into account in the Protocol and are included in the resulting balance of the Parties' contributions and obligations. RSA will not claim further compensation for the performance of common systems operations. NASA will not claim further compensation from RSA for its performance of common system operations.

4. The Parties will each be responsible for support of their own elements unless otherwise specified in the Protocol. For example, the Parties will each be responsible for the launch of their own elements, spares, logistics, sustaining engineering and utilization costs absent a specific agreement to the contrary. The FGB and SPP are examples of "specific agreements to the contrary" and are discussed in paragraphs 19 and 20. The Parties' overall responsibilities with regard to their own elements will be set forth in the NASA/RSA MOU. The Parties will each retain the use and benefits of the elements and systems they each provide, except as otherwise specifically agreed. For example, RSA will retain full use of its research modules and the electrical power generated by the Russian Segment (RS), absent agreement to the contrary, and will not have utilization rights in the American Segment (AS), again unless otherwise specifically agreed. Similarly, NASA will retain full use of the laboratories and electrical power generated by the AS, and will not have utilization rights in the RS unless otherwise specifically agreed. The basis for the evaluation of the Parties' contributions reflected in this Protocol is that the Parties each "keep what they bring". Understandings on currently known exceptions to this approach are also documented in this Protocol. Nothing in this Protocol precludes the Parties from reaching mutually agreeable barter in the future.

5. The reference configuration for the ISS vehicle is the Preliminary ISS Assembly Sequence, Revision B, as of March 1, 1996 (Appendix 1).
6. For purposes of cost sharing and assessing the Parties' relative contributions, the capabilities of the Parties' transportation vehicles have been used. Specific flight rates, crew and cargo loads and vehicles used for transportation to the Space Station will be determined through the agreed upon Program management mechanisms and operations planning functions.
7. The Parties agree that NASA, the lead integrator, with support of RSA, will perform ISS systems engineering and integration, ISS operations integration, and ISS utilization integration as specified in Appendix 2. These integration activities include utilization planning, integration and coordination for the Space Station as a whole, as well as activities identified in the attached balance of contributions. RSA will provide data and personnel to support this overall program integration effort and participate in the integrated operations and utilization planning for the strategic, tactical and execution phases. NASA and RSA will additionally each perform integration tasks for their own elements and segments, although these activities were not considered services provided for one Party by another. Both Parties agree to minimize operations costs and exchange of funds.
8. NASA's utilization integration contribution consists of the station-level analyses and efforts, with support of RSA, required to incorporate the integrated payload complement of the RS into the ISS. RSA will integrate RS payloads up to the segment level. By agreeing on NASA's leading station-level payload integration role, the Parties do not intend to imply that RSA has an allocation of AS utilization accommodations or resources, or vice versa for NASA. In the event that NASA or other partners conclude other cooperative science agreements or barter arrangements with RSA which bestow AS utilization accommodations or resources on RSA, any payload integration costs NASA incurs for such cooperative activities will be negotiated on a case by case basis as part of the barter arrangement. The same is true in the reverse instance where cooperative science agreements or barter arrangements bestow RS utilization accommodations or resources on NASA. In that case, any payload integration costs RSA incurs for such cooperative activities will be negotiated on a case by case basis as part of the barter arrangement.

9. The Parties agree that the planning for implementation of any transfer of Space Station resources, i.e. electrical power, between the Parties will be addressed through ISS Program integrated operations and utilization planning processes (strategic Consolidated Operations and Utilization Plan (COUP) development, tactical Increment Definition and Requirements Documents (IDRDs) development, execution-level integrated engineering assessments and the short term plan development, etc.). It will be necessary for RSA to participate in the Program's integrated planning forums, (i.e. Space Station Control Board, Systems Operations Panel, User Operations Panel, Multilateral Operations and Utilization Analysis and Integration Team (AIT), integrated tactical operations organization and, if resources are to be transferred, the Payload Operations Integration Center (POIC), etc.).

10. It was assumed that the Space Station will have a crew of 3 during assembly and a crew of 7 after assembly complete. The NASA/RSA MOU will set forth the general process for allocating flight opportunities and crew time, but paragraphs 11 and 12, below, describe the Parties' specific assumptions for the purpose of determining the overall balance of the Parties' contributions and obligations in this Protocol. Allocation of crew time and flight opportunities to the other Space Station partners will be in accordance with the terms of NASA's bilateral Memoranda of Understanding (MOUs) with those partners. This Protocol will only address the understanding between the Parties.

11.a. Crew During Assembly (through flight 19A): NASA and RSA will each have the right to an average of 50% of the 3 available crew flight opportunities. Each crew should include at least one representative from NASA and at least one representative from RSA. The Parties will each bear the responsibility for transporting and supporting on-orbit 50% of the 3-person crew. While the Parties will each receive 50% of the flight opportunities, this is an average balance over the entire assembly time frame and the Parties may not have equal shares at any given time. Detailed operational plans for allocating individual flight opportunities will be developed through normal operations planning processes. Crew time will first be devoted to systems operations and maintenance required to perform assembly tasks and Space Station operations and maintenance. Any time remaining will be devoted to utilization. Of crew time available for utilization, from first element launch up to the time when the GOJ accrues rights to on-orbit crew time, 50% of available time will be used to perform utilization on RS payloads and the remaining 50% will be used to perform utilization on AS payloads. After the GOJ accrues rights to on-orbit crew time, through flight 19A, its allocation of on-orbit utilization crew time will be drawn equally from the AS on-orbit crew time allocation and the RS on-orbit crew time allocation. It is assumed that no other partner will have rights to

on-orbit crew time through the completion of the assembly phase. In the event that the Parties end assembly with flight opportunities to their credit, those opportunities will be exercised in the assembly complete phase. If any other partner ends assembly with flight opportunities to their credit, those opportunities will be exercised in the assembly complete phase and drawn from the AS flight allocation. Each Party has a right to visiting crew. If the Parties have visiting crew, each Party will provide for the transport (including rescue), support (supplies and life support/habitation) and all expenses on Earth for those visiting crews. As a result, the visiting crews will not count as use of a Party's allocation of flight opportunities or crew time on-orbit rights. Plans for visiting crews will be coordinated through the standard ISS operations planning processes. As is the case for all utilization accommodations and resources, the Parties may receive additional rights to flight opportunities or crew time through barter.

11.b. Crew Post Assembly (after flight 19A): Following the completion of assembly of the Space Station and initial operational verification of the U.S.-provided crew rescue vehicle that allows an increase in the crew complement to 7, RSA will have the rights to the flight opportunities and on-orbit crew time of 3 crew to perform RS systems operations and utilization activities. NASA and the remaining Space Station partners will share the remaining four flight opportunities for their nationals and the time of the equivalent of four remaining crew to perform AS systems operations and utilization activities. In the event the crew rescue vehicle provided by the U.S. is not available immediately after flight 19A, and the ISS has crew complement of 6 and not 7, the Parties will meet to discuss appropriate action.

12. Crewmembers will work together as a single team. Regardless of nationality and tasks assigned to any individual crew person, the entire crew will train together and perform duties on-orbit as a single integrated international crew with one ISS Commander. Each Party will assign a crewmember to have primary responsibility for its segment. The ISS Crew Operations Board will further define the details of the integrated crew concept.

13. The Parties agree that RSA provides the capability to return the entire international crew (up to three) in off-nominal situations through the completion of assembly (flight 19A in June 2002). Since the entire vehicle capability of the Soyuz TM is assumed in determining RSA's cost credit for crew rotation and unplanned crew return, the seats required on the Soyuz (up to three) will remain available for use by the ISS crew. NASA will provide crew rescue capability following the completion of assembly. In the event the NASA crew rescue capability becomes available later than is currently planned (flight 19A in June 2002), RSA agrees to continue to provide the capability to rescue the entire international crew using the Soyuz for agreed upon compensation from NASA.

14. For purposes of determining the balance of the Parties' contributions, 6 Shuttle flights and 11 Soyuz flights rotating 51 crewmembers have been assumed for the assembly phase (after assembly complete, crew rotation was assumed to be provided by each Party proportional to its share of the crew, thus not requiring any exchange of compensation/contribution credit). Additional Shuttle flights (currently estimated at 5) during assembly might be used, upon mutual agreement of the Parties, when necessary to provide flexibility in the crew rotation model. NASA recognizes potential impacts to RSA if the use of additional Shuttle flights results in a Soyuz rotating less than three crew and these potential impacts have been taken into account in determining the balance of the Parties' contributions. NASA recognizes that Soyuz must fly with a minimum of two crew, but, as in the case of Shuttle-rotated crew, the mission tasks and required training will determine the details of crew rotation. NASA is not claiming contribution credit or compensation from RSA for the additional Shuttle crew rotation flights. The Parties agree to continue to work together on the optimum number and interval of Shuttle crew rotation flights and to resolve the issues of partial or full rotation of the crew.

15. Training expenses: Top level agreements regarding Space Station crew will be addressed in the context of the NASA/RSA MOU negotiations. Details of the crew training curriculum and process, including the curriculum and sites for advanced and increment-specific training for Space Station crew, will be defined as part of normal operations planning processes. For the purposes of the Protocol, it is understood that each Party is financially responsible for all compensation (salary and per diem), travel, personal interpreters, medical expenses, lodging and other living costs on Earth for Space Station crew which it provides. However, it is further agreed that the training of the U.S. and Russian crew shall be provided by the host country free of charge. RSA will not be charged training costs for crew training in the United States and NASA will not be charged training costs for crew training in Russia. Crew training includes instruction, training materials and equipment, access to all necessary facilities and all costs for activities in the jointly agreed training plan and curriculum. This reciprocal bilateral waiver of training fees is intended to include cases where, pursuant to a cooperative agreement for example, someone other than a U.S. national is tendered for training in Russia as part of NASA's flight opportunity allocation or vice versa. NASA agrees to discuss adoption of a similar approach for all ISS partners during the course of its bilateral MOU negotiations with ESA, GOJ and CSA.

16. Each Party will be responsible for providing food, supplies and personal items for its astronauts and cosmonauts who serve as Space Station crew. Launch of these items has been taken into account in determining the balance of the Parties contributions during the assembly phase. After assembly complete, it is assumed each Party will supply and deliver these items for its own crew or arrange for launch at its own expense.

17. With regard to propellant delivery, the Parties based their arrangement on the assumption that the total propellant required for the life of the station is 112 MT (this estimate does not include the propellant required for off-nominal situations, such as abnormal solar cycles). Of that total, 71% is attributable to the AS (80 MT) and 29% is attributable to the RS (32 MT). NASA will deliver 24 MT after assembly complete. RSA will deliver the remaining 56 MT to ISS for the AS. Total RSA propellant delivery obligation over the life of the station is 88 MT (56 MT for the AS and 32 MT for the RS). At the conclusion of the assembly phase (or earlier if required), the Parties will review the actual use of propellant during assembly and consider whether propellant requirements for the remaining life of ISS should be reviewed and revised. In the event of revisions, the Parties will reach a mutually acceptable arrangement for the adjustment of their obligations. Barter at the technical level will be the primary goal, although other arrangements may be substituted in the event an acceptable barter is not feasible.

18. The Parties agree to continue efforts to improve operations efficiencies onboard the ISS, including common and interoperable systems and interfaces to crew.

19. The FGB is a U.S. element, technically integrated into the Russian Segment. For purposes of establishing the balance of the Parties' contributions, the FGB is considered NASA's responsibility, except as specifically otherwise agreed. This means for example that the FGB mass was attributed to the AS for purposes of assessing the relative shares of propellant required by both segments and NASA will have exclusive rights to the FGB's dry cargo stowage capability. The AS owns the interior stowage volume of the FGB. RSA is responsible for maintenance of the FGB and manufacture/delivery of FGB spares. The AS will provide the on-orbit stowage volume for FGB spares. RSA agrees the on-orbit stowage requirements for FGB spares will comply with requirements for AS stowage volume specified in ICD 42121 (PMA to FGB). The Parties have agreed to their respective responsibilities with regard to the FGB in the February 5, 1995 Protocol between RSA and NASA (the FGB protocol) and continue to honor those commitments. RSA has assumed the costs associated



with launching the FGB on Proton. This has been taken into account as a RSA contribution in the balance of contributions, along with all of RSA's other obligations referenced in the FGB Protocol.

20. NASA agrees to launch the SPP on the Shuttle and to deliver the SPP to the ISS. NASA further agrees to assemble the SPP on orbit with the cooperation and technical support of RSA. The technical tasks required to transfer and assemble the SPP have been defined and agreed to in Appendix 3. Funding responsibilities for the technical tasks have also been agreed to and identified in Appendix 3. As stated under section 4.1 of Appendix 3, NASA and RSA are jointly responsible for the certification of the SPP transfer and berthing operation. NASA assumes no liability for the operation or overall performance of the SPP. RSA is ultimately responsible for the certification of the SPP and its subsystems. RSA and NASA agree that the Non-Standard Shuttle Services referenced under section 6 of Appendix 3 are based on initial design requirements identified in March, 1996. Costs for additional Non-Standard Shuttle Services beyond those listed in Appendix 3 resulting from subsequent SPP design changes/modifications are not included in this agreement. Separate negotiations will be conducted between NASA and RSA to specify funding responsibility if any additional Non-Standard Shuttle Services are required.

21. In assessing the Parties' relative contributions for the ISS configuration referenced in paragraph 5, current or future losses or gains of efficiency caused by a change in inclination, altitude, launch delays or inability to utilize the full capability of a transportation system, etc. will not be considered a contribution unless otherwise specifically agreed. Loss of efficiency or cost impacts caused by changes from previous design configurations to the current baseline configuration will likewise not be considered a contribution. Financial and other impacts from any loss of efficiency or previous design changes will be the sole responsibility of the Party claiming the loss of efficiency or cost impact. Further, any modifications and upgrades carried out by NASA and RSA in collaboration with other Partners to transition from the Mir-2 Program (Service Module modifications, LTV development, etc.) and Freedom Program (Shuttle modifications, etc.) to the ISS Program have been considered and accepted as balanced.



22. For purposes of the Protocol, the hardware, software and data which the Parties exchange pursuant to the NASA/RSA Bilateral Hardware, Software and Data Exchange Agreements, are now and will continue to be upon completion, considered balanced and such agreed trades will require no additional exchange of goods, services or funds.

23. The Parties agree that the main operations language for activities under this Agreement will be the English language, and data and information generated or provided under this Agreement will be in the English language, unless otherwise agreed. For example, joint program meetings and telecons will be conducted in English. The Crew Operations Panel (under the Space Station Multilateral Coordination Board) will determine the language used for crew training. Therefore, the Parties will implement this understanding to the extent possible and documentation between NASA and the Russian side will be exchanged in English. However, in recognition of the need for a transition period for the Russian participants to undergo English language training, Program activities may be conducted in English through use of interpretation and translation services, and NASA and RSA will work on a reciprocal basis to provide appropriate and reasonable levels of interpretation and translation support for the technical and managerial meetings they host through the completion of the assembly and initial operational verification of the Space Station.

24. RSA will make available, arrange for availability or continue to provide for NASA use office space at the following facilities: RSA, RSC Energia, Khrunichev, TsUP, and Gagarin Cosmonaut Training Center. NASA will continue to make available office space at the Johnson Space Center for RSA's use. In the case of established offices, the Parties will continue to provide the scope of office space and support currently provided. In the case of offices yet to be established, the Parties will work together to reach mutually satisfactory arrangements, recognizing that the cost of the Parties' provision of such office space and support have been taken into account and are considered balanced from a financial perspective. NASA will continue to staff and operate the NASA Moscow Liaison Office within the US Embassy in Moscow at its own expense.

25. Once the funding identified in contract NAS 1510110 for Russian personnel travel is depleted, each Party will bear the costs incurred by its personnel (civil servants and contractors) traveling to participate in the Space Station Program activities.

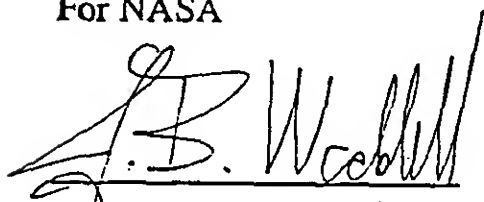
26. The efforts of the Parties to monitor and provide warning on/ response to space debris have been considered and require no further compensation.

27. Except as otherwise specifically agreed in the Protocol, the Parties' provision of backup data transmission capability and backup command and control to each other for contingency purposes has been considered and deemed balanced.

28. The attached Appendix 2 further specifies the balance of goods and services which each Party contributes.

Done in Moscow, in duplicate, this 11th day of June, 1996, in English and Russian languages, each text being equally authentic.

For NASA

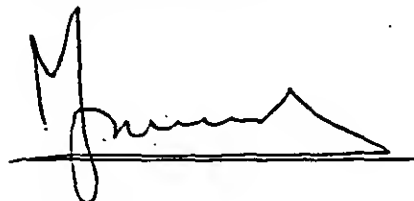
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J. B. Waddell

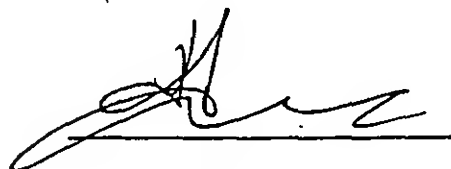
For RSA

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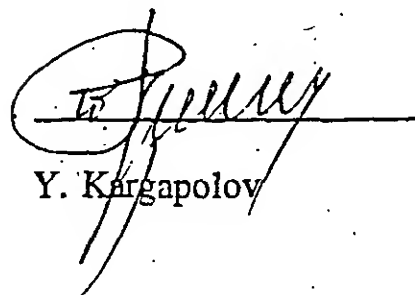
M. Sinelschikov

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A. Krasnov

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A. Derechin

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Y. Kargapolov